

Nicholas Marks

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EDUCATION

Northwestern University, Evanston, IL

B.S. Mechanical Engineering – Aerospace Concentration, Minor in Spanish

June 2022

M.S. Mechanical Engineering – Robotics Concentration

June 2023

GPA: 3.77/4.00

SKILLS

Programming: Python, C, C++, Bash, MATLAB, Rust

Software: ROS/ROS2, Linux, Git, SolidWorks, Siemens NX, LaTeX

Manufacturing: 3D printing, filament winding, carbon fiber manufacturing, manual mill, CNC mill, water jet

Certifications: NAR Level 2 High Power Rocketry Certification

PROFESSIONAL EXPERIENCE

Mechanical Engineering Intern – Applied Thin Films Inc. July 2021 – September 2022

- Designed, prototyped, and tested a tabletop CNC machine for automating the infiltration process of ceramic matrix composite layups
- Wrote a G-code generator using Python to produce and simulate rolling patterns for the automated composite layup system
- Programmed/operated a CNC water jet for cutting ceramic matrix composite panels

X-Ray Optics Researcher – Northwestern University CIERA, Prof. Melville Ulmer's Group (Summers 2019 and 2020)

- Wrote MATLAB software to analyze surface profile data of deformable mirrors collected from a Shack-Hartmann wavefront sensor
- Integrated a computer-controlled relay with MATLAB control software to switch between AC and DC power supplies remotely

Publications

Melville P. Ulmer, Mohammadreza Jalilvand, **Nicholas A. Marks** et al., "The prospects for applying magnetic smart materials combined with shape memory alloys to produce correctable and deployable space telescopes"; <https://doi.org/10.1117/12.2564726>

ADDITIONAL EXPERIENCE

Chief Engineer – NUSTARS Rocketry Team, Sept 2021 – June 2022

- Oversaw all technical aspects of the project which consisted of the design and construction of five high power rockets which were successfully flown in a collegiate rocketry competition
- Designed, built, and launched a NAR Level 2 Certification rocket from scratch

Launch Vehicle Team Lead – NUSTARS NASA Student Launch Team, Sept 2020 – May 2021

- Introduced in-house carbon fiber manufacturing for use in constructing rocket airframes, fins, and nose cones with a combination of filament winding, vacuum bagging, and hand-layup techniques
- Led the design and production of the club's first ever 100% in-house built launch vehicle including material selection, flight simulation, manufacturing, and assembly

Independent Study: Reaction wheel for rocket roll control, Fall 2020

- Developed and tested a reaction wheel for autonomously controlling a rocket about its roll axis